

**History of gymnosperms.**—BERRY<sup>13</sup> has published his paper prepared for the symposium on gymnosperms at the meeting of the Botanical Society at the University of California last August. He outlines the paleobotanical evidence in reference to gymnosperms, which extends more or less continuously from the Devonian to the present time. A diagram not only summarizes the data as to the age and relative abundance of the groups, but also indicates the author's suggestions as to phylogeny. The cycadophyte phylum rises directly from the fern stock through Cycadofilicales, which group in turn gives rise to Williamsoniales, Cycadeoidales, and Cycadales. This splitting up of Bennettiales into two phyla seems to be justified by our increasing knowledge of the *Williamsonia* forms. The Cordaitales are represented as having an independent origin from the fern stock and developing the coniferophytes. The araucarians are credited with being the oldest conifer stock, the groups of Pinaceae being left in a more or less problematical position as to age of origin and ancestral group, and among them the Abietineae are regarded as more modern than the Taxodineae and Cupressineae. Taxaceae and the Ginkgoales are left unconnected, the latter beginning in the later Paleozoic, and the former recognized at the base of the Mesozoic.—J. M. C.

**Morphology of Phylloglossum.**—SAMPSON<sup>14</sup> has investigated this much discussed monotypic genus, chiefly with reference to its "annual storage tuber," the so-called "protocorm" of TREUB. As a result of detailed anatomical investigation, the author concludes that this tuber is "a specialized leafy axis, the terminal bud of which functions both as a means of vegetative reproduction and as an organ of perennation," comparable with the resting buds of *Lycopodium inundatum* and the "tubers" of certain Indian species of *Selaginella*. That in fertile plants the tuber is a modified branch is supported by the following facts: (1) a gap is left in the stele of the main axis by the exit of the vascular strand of the tuber; (2) the stele of the tuber often shows a corresponding gap; and (3) the tuber bears leaves, some of which are considerably reduced. The sterile plant consists of a simple axis, the apex of which has formed a storage tuber. The author concludes that the tuber of *Phylloglossum*, therefore, can no longer be compared with the protocorm of *Lycopodium cernuum*, but the two genera are found to be more nearly related by the fact that *Phylloglossum* is shown to be not characteristically an unbranched form.—J. M. C.

**Flavone derivatives in plants.**—SHIBATA and KISHIDA<sup>15</sup> find that aerial parts of high mountain plants are generally much richer in flavone bodies

<sup>13</sup> BERRY, E. W., The geological history of gymnosperms. *Plant World* 19:27-41. figs. 2. 1915.

<sup>14</sup> SAMPSON, K., The morphology of *Phylloglossum Drummondii* Kunze. *Ann. Botany* 30:315-331. figs. 5. 1916.

<sup>15</sup> SHIBATA, K., und KISHIDA, M., Untersuchungen über das Vorkommen und physiologische Bedeutung der Flavorderivate in den Pflanzen. II Mitt. *Bot Mag. Tokyo* 29:316-332. 1915.